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EXAMINER	
HANNAHER, CONSTANTINE	
ART UNIT	**PAPER NUMBER**
2884	

DATE MAILED: 04/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/658,042	GUO ET AL.	
	Examiner	Art Unit	
	Constantine Hannaher	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,11-50,53,54,56-66 and 71-91* is/are pending in the application.

4a) Of the above claim(s) *33-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11-32,36-50,53,54,56-66 and 71-91* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-8,11-50,53,54,56-66 and 71-91* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant is required to indicate which claims are readable on the elected species, MPEP § 809.02(a). The reply of February 27, 2006 could have been held non-responsive on that basis alone.

2. Claims 33-35 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on September 19, 2005.

Specification

3. Section 608.01 of the MPEP states in part:

> In order to minimize the necessity in the future for converting dimensions... to the metric system of measurements when using printed patents... all patent applicants should use the metric (S.I.) units followed by the equivalent English units when describing their inventions....

The Assistant Secretary and Commissioner of Patents and Trademark strongly reiterated and emphasized strong encouragement for patent applicants to use the metric system in patent applications in a message appearing at 1135 O.G. 55 dated February 18, 1992. At some future time, the USPTO will consider making it a requirement.

Note the use of the micron and the angstrom. The Examiner is unable to require the use of SI units.

Claim Objections

4. Claim 81 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 42 already requires that the diaphragm is made of benzocyclobutene.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-8, 11-32, 36-40, 74-80, 41, 42, 81-87, 43, 88, 89, and 44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not describe the location of an infrared sensitive component on the diaphragm and the specification does not describe the infrared sensitive component above the diaphragm, such that one skilled in the art is not able to make the invention.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 73 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 73 recites the limitation "said etching step" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. Claims 45 and 72 do not establish an etching step.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1-8, 11-19, 27, 28, 30-32, 36, 37, 39, 40, 75, 77-80, 41, 43, 88, and 89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bly (US004959546A) in view of Verhaegen (US006380605B1).

With respect to independent claim 1, Bly discloses a detector **19** (Fig. **1**) comprising a base **20** having a recess formed therein, a diaphragm **19*a*** generally extending across the recess, and an infrared sensitive component **19*e*** supported by the diaphragm. The diaphragm **19*a*** in the detector of Bly includes a material (column 2, lines 26-27) having the recited property since the disclosed material is identical to that disclosed in applicant's specification as having that property. While the diaphragm material in the detector of Bly with this property may be one of a plurality of materials (column 2, lines 26-27), benzocyclobutene is not in the list. Verhaegen shows that benzocyclobutene is a known material for layer **55** which extends across a recess (Fig. **5F**) and supports (by burial) an infrared sensitive component **54** and supports (by adjacency) an infrared sensitive component **56**. In view of that suitability and the compatibility with aluminum (layer **19d** of Bly) as described by Verhaegen, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to modify the detector of Bly such that diaphragm **19***a* was of a material including benzocyclobutene.

With respect to dependent claims 2-8, the diaphragm **19***a* suggested by the detector of Bly and Verhaegen is a material having the recited properties in view of the identity thereof.

With respect to dependent claim 11, the diaphragm **19***a* in the detector of Bly has a thickness in the recited range (column 2, line 25-26).

With respect to dependent claim 12, the diaphragm **19***a* in the detector of Bly has a surface area in a range which overlaps the recited range (column 3, line 4).

With respect to dependent claim 13, although Bly does not identify the base **20** or its thermal conductivity, it does not take more than ordinary skill in the art to understand that a thermal conductivity for diaphragm **19***a* which is at least one-tenth that for the base is useful for maintaining sensitivity to incoming infrared radiation by reducing diffusion of the thermal energy. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the thermal conductivity of the base **20** was in the claimed range.

With respect to dependent claim 14, the diaphragm **19***a* suggested by the detector of Bly and Verhaegen is a material having the recited properties in view of the identity thereof.

With respect to dependent claim 15, the diaphragm **19***a* in the detector of Bly is located as recited (Fig. **1**).

With respect to dependent claim 16, the infrared sensitive component in the detector of Bly does not extend to any part of the diaphragm **19***a* which is not located above the recess. Verhaegen shows that an infrared sensitive component which does so extend may be supported across a recess by a diaphragm. In view of the advantages in employing an infrared sensitive component as

described by Verhaegen (column 2, lines 10-12), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***e* extended to a part of the diaphragm **19***a* which was no located above the recess.

With respect to dependent claim 17, the infrared sensitive component **19***e* in the detector of Bly includes at least one property of the recited type (column 2, lines 29-30) and the variation in the index of refraction can be sensed by instrumentation (column 3, lines 34-50).

With respect to dependent claim 18, the infrared detector of Bly does not generate an electrical signal. Verhaegen shows that an infrared sensitive component which generates an electrical signal may be supported across a recess by a diaphragm. In view of the reduced optical complexity in sensing an electrical signal by instrumentation rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***a* generated an electrical signal which could be sensed by instrumentation.

With respect to dependent claim 19, the infrared detector of Bly does not include a thermopile. Verhaegen shows that an infrared sensitive component which includes a thermopile may be supported across a recess by a diaphragm. In view of the reduced optical complexity in sensing infrared radiation using a thermopile rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***a* included a thermopile.

With respect to dependent claim 27, the detector of Bly further includes an infrared radiation absorbing material **19***b*.

With respect to dependent claim 28, although Bly does not identify the base **20** or its thermal conductivity, it does not take more than ordinary skill in the art to understand that a thermal conductivity for diaphragm **19***a* which is at least one-tenth that for the base is useful for maintaining sensitivity to incoming infrared radiation by reducing diffusion of the thermal energy. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the thermal conductivity of the base **20** was in the claimed range.

With respect to dependent claim 30, it would have been obvious to one of ordinary skill in the art at the time the invention was made to consider the one material layer **19***d* in the detector of Bly as an adhesive layer to improve the adhesion of infrared sensitive component **19***e* to the diaphragm **19***a* since nothing else connects the two layers.

With respect to dependent claim 31, the material layer **19***d* in the detector of Bly is a bright reflective metal (column 2, line 28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to identify the recited bright reflective metals as the metal for layer **19***d* in the detector of Bly since Bly is not limiting ("...a metal such as...") and their properties are well known.

With respect to dependent claim 32, the detector **19** of Bly is of the recited type.

With respect to dependent claim 36, the infrared sensitive component **19***e* in the detector of Bly is separated from the diaphragm **19***a* by at least one material **19***d* between them.

With respect to dependent claim 37, it would have been obvious to one of ordinary skill in the art at the time the invention was made to consider the one material layer **19***d* in the detector of Bly as an adhesive layer to improve the adhesion of infrared sensitive component **19***e* to the diaphragm **19***a* since nothing else connects the two layers.

With respect to dependent claim 39, the diaphragm **19***a* suggested by the detector of Bly and Verhaegen is a material having the recited properties in view of the identity thereof.

With respect to independent claim 40, Bly discloses a detector **19** (Fig. **1**) comprising a base **20** having a recess formed therein, a diaphragm **19***a* generally extending across the recess, and an infrared sensitive component **19***e* supported by the diaphragm. While the diaphragm material in the detector of Bly may be one of a plurality of materials (column 2, lines 26-27), benzocyclobutene is not in the list. Verhaegen shows that benzocyclobutene is a known material for layer **55** which extends across a recess (Fig. **5F**) and supports (by burial) an infrared sensitive component **54** and supports (by adjacency) an infrared sensitive component **56**. In view of that suitability and the compatibility with aluminum (layer **19d** of Bly) as described by Verhaegen, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that diaphragm **19***a* was of a material including benzocyclobutene.

With respect to dependent claim 75, the infrared detector of Bly does not generate an electrical signal. Verhaegen shows that an infrared sensitive component which generates an electrical signal may be supported across a recess by a diaphragm. In view of the reduced optical complexity in sensing an electrical signal by instrumentation rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***a* generated an electrical signal which could be sensed by instrumentation.

With respect to dependent claim 77, the diaphragm in the detector suggested by Bly and Verhaegen extends entirely across and generally entirely covers the recess.

With respect to dependent claim 78, the infrared sensitive component in the detector suggested by Bly and Verhaegen is generally entirely covered by the diaphragm.

With respect to dependent claim 79, the diaphragm in the detector suggested by Bly and Verhaegen is continuous and lacks any holes formed therethrough.

With respect to dependent claim 80, at least one surface of the infrared sensitive component the diaphragm in the detector suggested by Bly and Verhaegen is configured as recited in view of infrared transparent layer **19***e*.

With respect to independent claim 41, Bly discloses a detector **19** (Fig. **1**) comprising a base **20** having a recess formed therein, a diaphragm **19***a* generally extending across the recess, and an infrared sensitive component **19***e* supported by the diaphragm. The diaphragm **19***a* in the detector of Bly includes a material (column 2, lines 26-27) of the recited type in view of the identity thereof. While the infrared detector of Bly does not generate an electrical signal, Verhaegen shows that an infrared sensitive component which generates an electrical signal may be supported across a recess by a diaphragm. In view of the reduced optical complexity in sensing an electrical signal by instrumentation rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***a* generated an electrical signal which could be sensed by instrumentation.

With respect to independent claim 43, Bly discloses a detector **19** (Fig. **1**) comprising a base **20** having a recess formed therein, a diaphragm **19***a* generally extending across the recess, and an infrared sensitive component **19***e* supported by the diaphragm. The diaphragm **19***a* in the detector of Bly includes a material (column 2, lines 26-27) having the recited property since the disclosed material is identical to that disclosed in applicant's specification as having that property. While the infrared detector of Bly does not generate an electrical signal, Verhaegen shows that an infrared sensitive component which generates an electrical signal may be supported across a recess by a

diaphragm. In view of the reduced optical complexity in sensing an electrical signal by instrumentation rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***a* generated an electrical signal which could be sensed by instrumentation.

With respect to dependent claim 88, at least one surface of the infrared sensitive component the diaphragm in the detector suggested by Bly and Verhaegen is configured as recited in view of infrared transparent layer **19***e*.

With respect to dependent claim 89, the infrared sensitive component in the detector suggested by Bly and Verhaegen is entirely and directly supported by the diaphragm.

12. Claims 19-26, 29, 38, 74, 76, 42, and 81-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bly (US004959546A) and Verhaegen (US006380605B1) as applied to claims 1 and 40 above, and further in view of Endo *et al.* (US006348650B1).

With respect to dependent claim 19, the infrared detector of Bly does not include a thermopile. Endo *et al.* shows that an infrared sensitive component which includes a thermopile may be supported across a recess by a diaphragm. In view of the reduced optical complexity in sensing infrared radiation using a thermopile rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that the infrared sensitive component **19***a* included a thermopile.

With respect to dependent claim 20, the pitch of the thermopile suggested by Endo *et al.* is a construction detail within the ordinary skill in the art in view of such concerns as ruggedness, resolution, and the like.

With respect to dependent claims 21 and 22, a dictionary definition of what constitutes a thermopile is so well known as to require no citation, Endo *et al.* confirms. See, for example, column 14, lines 6-8.

With respect to dependent claims 23 and 24, output pads **12** of the type recited are shown by Endo *et al.*

With respect to dependent claim 25, the recited alloys are utterly well known for the purpose of manufacturing a thermopile. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector suggested by Bly and Endo *et al.* to make use of known alloys for the infrared sensitive component.

With respect to dependent claim 26, the infrared sensitive component suggested by Endo *et al.* includes polysilicon.

With respect to dependent claim 29, the base **1** suggested by Endo *et al.* has a thickness in the claimed range (column 16, lines 64-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify a thickness in the claimed range for the base **20** in the detector suggested by Bly and Verhaegen in view of the miniaturized chip size attainable thereby.

With respect to dependent claim 38, a passivation layer (column 14, line 16) is suggested by Endo *et al.* In view of the improved sensitivity described by Endo *et al.* (column 27, lines 54-61) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector suggested by Bly and Verhaegen to further include a passivation layer.

With respect to dependent claim 74, the diaphragm **19*a*** in the detector of Bly has a pair of opposed major sides and the infrared sensitive component is located on only a single side of the diaphragm. Endo *et al.* shows that an infrared sensitive component which includes a thermopile may

be supported across a recess by a diaphragm by its location on only a single side of the diaphragm. In view of the reduced optical complexity in sensing infrared radiation using a thermopile rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector suggested by Bly and Verhaegen such that the infrared sensitive component **19***a* included a thermopile.

With respect to dependent claim 76, the infrared sensitive component in the detector suggested by Bly, Verhaegen, and Endo *et al.* is entirely and directly supported by the diaphragm.

With respect to independent claim 42 and dependent claim 81, Bly discloses a detector **19** (Fig. **1**) comprising a base **20** having a recess formed therein, a diaphragm **19***a* generally extending across the recess, and an infrared sensitive component **19***e* supported by the diaphragm. The diaphragm **19***a* in the detector of Bly includes a material (column 2, lines 26-27) having the recited property since the disclosed material is identical to that disclosed in applicant's specification as having that property. While the diaphragm material in the detector of Bly with this property may be one of a plurality of materials (column 2, lines 26-27), benzocyclobutene is not in the list. Verhaegen shows that benzocyclobutene is a known material for layer **55** which extends across a recess (Fig. **5F**) and supports (by burial) an infrared sensitive component **54** and supports (by adjacency) an infrared sensitive component **56**. In view of that suitability and the compatibility with aluminum (layer **19d** of Bly) as described by Verhaegen, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Bly such that diaphragm **19***a* was of a material including benzocyclobutene. The infrared sensitive component in the detector of Bly is located on only a single side of the diaphragm. Endo *et al.* shows that an infrared sensitive component which includes a thermopile may be supported across a recess by a diaphragm by its location on only a single side of the diaphragm. In view of the reduced optical complexity in sensing

infrared radiation using a thermopile rather than a change in the refraction, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector suggested by Bly and Verhaegen such that the infrared sensitive component **19***a* included a thermopile.

With respect to dependent claim 82, Endo *et al.* confirms that it is entirely routine for thermocouples to generate an electrical signal indicative of infrared radiation.

With respect to dependent claim 83, the diaphragm in the detector suggested by the applied references extends entirely across and generally entirely covers the recess.

With respect to dependent claim 84, the infrared sensitive component in the detector suggested by the applied references is generally entirely covered by the diaphragm.

With respect to dependent claim 85, the diaphragm in the detector suggested by the applied references is continuous and lacks any holes formed therethrough.

With respect to dependent claim 86, a dictionary definition of what constitutes a thermopile is so well known as to require no citation, Endo *et al.* confirms. See, for example, column 14, lines 6-8.

With respect to dependent claim 87, at least one surface of the infrared sensitive component the diaphragm in the detector suggested by the applied references is configured as recited in view of infrared transparent layer **19***e*.

13. Claims 45-50, 53, 54, 56-64, 71-73, 90, and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Folsom *et al.* (US005879572A) in view of Endo *et al.* (US006348650B1).

With respect to independent claim 45, Folsom *et al.* discloses a method for forming a detector corresponding to the illustration in Fig. **3** which comprises the steps of providing a base **12**, forming or locating a component **14** on the base, forming or locating a benzocyclobutene diaphragm

26 on or over the component, and removing at least part of the base to form a recess **16** such that the recess is located below at least part of the component. Component **14** in the detector of Folsom *et al.* includes piezoresistive elements **18**, but Endo *et al.* shows that an infrared sensitive thermocouple component is routinely supported across a recess in a base. In view of the advantageous elimination of the deposited film **2a** in Endo *et al.* as described by Folsom *et al.* at column 1, line 62 to column 2, line 13, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method suggested by Folsom *et al.* such that sensor **14** was an infrared sensitive thermocouple component. The diaphragm **26** in the method of Folsom *et al.* has a pair of opposed major sides, and the components **18** are entirely located on only a single side thereof.

With respect to dependent claim 46, the removing step in the method of Folsom *et al.* includes the removal of substantially all of the base **12** located as recited (Fig. **3**).

With respect to dependent claims 47-50, 62, and 71, the material of the diaphragm **26** in the method of Folsom *et al.* has the recited properties in view of the identity thereof (column 4, lines 13-28).

With respect to dependent claim 53, the thickness of the diaphragm **26** formed in the method of Folsom *et al.* is a choice within the ordinary skill in the art in view of such concerns as cavity size, component thickness, and the like. Folsom *et al.* establishes an open-ended range for the entire thickness of the diaphragm (column 1, lines 39-40) which encompasses the claimed range with sufficient specificity that one of ordinary skill in the art would have expected the same behavior in the claimed range.

With respect to dependent claim 54, the removing step in the method of Folsom *et al.* is as recited (Fig. **3**).

With respect to dependent claim 56, the first forming or locating step in the method of Folsom *et al.* would be as recited in view of the plurality of thermocouples and the utterly standard pair of legs with Seebeck coefficients of opposite value disclosed by Endo *et al.*

With respect to dependent claim 57, the recited alloys are utterly well known for the purpose of manufacturing a thermopile. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method for forming a detector suggested by Folsom *et al.* and Endo *et al.* such that known alloys were used for the infrared sensitive thermocouple component.

With respect to dependent claim 58, the infrared sensitive thermocouple component in the method of Endo *et al.* includes polysilicon (column 4, lines 4-12).

With respect to dependent claim 59, the method suggested by Folsom *et al.* would include the recited step in view of metallizations **20**.

With respect to dependent claim 60, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide whatever manner of access to the formed or located output pad **20** as was necessary. In view of the choice of complete coverage of the base by the diaphragm or removal of the diaphragm in the method of Folsom *et al.* , a further step of etching the diaphragm to expose an output pad **20** would have been obvious.

With respect to dependent claim 61, Endo *et al.* suggests the step of depositing an infrared absorbing material one at least one side of the diaphragm (column 14, lines 16-17). In view of the improved absorption of infrared energy, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Verhaegen to further include such a step of depositing.

With respect to dependent claim 63, the base **1** suggested by Endo *et al.* has a thickness in the claimed range (column 16, lines 64-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify a thickness in the claimed range for the base **12** in the method of Folsom *et al.* in view of the miniaturized chip size attainable thereby.

With respect to dependent claim 64, the method of Folsom *et al.* further includes the step of forming or locating a layer which serves as a "wafer" adhesion layer (column 4, lines 41-53).

With respect to dependent claim 72, the diaphragm in the method of Folsom *et al.* serves as a passivation layer. Endo *et al.* discloses passivation layer **8**. In view of the desire to passivate metal connections, in modifying the method of Folsom *et al.* to form an infrared sensitive thermocouple as the component **18**, it would have been obvious to place the passivation layer **8** of Endo *et al.* under the component such that removal of the base **12** to form cavity **16** exposed the passivation layer covering metal connections **7** of Endo *et al.* while diaphragm **26** served to passivate from the other side of the metal connections.

With respect to dependent claim 73, to the extent that passivation was required between metal connections **7** and the base, it would have been obvious to one of ordinary skill in the art at the time the invention was made to remove any passivation layer **8** exposed by the removing step in the method of Folsom *et al.* such that infrared might reach the infrared sensitive thermocouple component without hindrance.

With respect to dependent claim 90, at least one surface of the infrared sensitive thermocouple component the diaphragm in the detector suggested by Folsom *et al.* and Endo *et al.* is configured as recited in view of the cavity in the base.

With respect to dependent claim 91, a dictionary definition of what constitutes a thermopile is so well known as to require no citation, Endo *et al.* confirms. See, for example, column 14, lines 6-8.

14. Claims 65 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Folsom *et al.* (US005879572A) and Endo *et al.* (US006348650B1) as applied to claim 64 above, and further in view of Gerber *et al.* (US005087312A).

With respect to dependent claim 65, Gerber *et al.* identifies chromium as a known adhesion layer between a dielectric **7** and metal elements **1, 2, 3** (Fig. **5** and column 3, lines 24-36). In view of the improved performance of an infrared sensitive thermopile as suggested by Gerber *et al.* by the promotion of adhesion between thermocouple elements and a support therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method suggested by Folsom *et al.* and Endo *et al.* such that a layer was, or included, chromium.

With respect to dependent claim 66, Gerber *et al.* discloses that an adhesion layer between a dielectric **7** and metal elements **1, 2, 3** (Fig. **5** and column 3, lines 24-36) are known. In view of the improved performance of an infrared sensitive thermopile as suggested by Gerber *et al.* by the promotion of adhesion between thermocouple elements and a support therefor, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method suggested by Folsom *et al.* and Endo *et al.* such that a diaphragm adhesion layer was formed or located between the infrared sensitive component and the diaphragm **26.**

Response to Submission(s)

15. The amendment filed February 27, 2006 has been entered.

16. Applicant's arguments filed February 27, 2006 have been fully considered but they are not persuasive.

With respect to the rejection under 35 U.S.C. 112, first paragraph, the reference to the specification at page 2 is to a repetition of the claim language. As such, this portion of the specification provides a written description, but this does not reply to rejection for lack of enablement. As made plain by the other portions of the specification and the various views of the drawings, the infrared sensitive component is buried in diaphragm **16**, that is, the components are *under* the diaphragm. See especially page 14, lines 11-15 explaining that the diaphragm is applied over the components. Thus, it is appropriate to reject the claims as the specification does not describe how to make components either on or above the diaphragm.

A rejection under 35 U.S.C. 112, first paragraph, speaks to a loss of right (a claim so rejected might be patentable but not to that applicant) and thus any indication of allowability for a claim so rejected is inappropriate. To the extent that the references are fairly applied to claims 1, 5, and 18, and in view of the disclosure of Folsom *et al.*, an indication of allowability for claim 44 would be premature.

In response to applicant's argument that the layer **55** of Verhaegen is not a membrane, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

For at least the reasons explained above, Applicant is not entitled to a favorable determination of patentability in view of the arguments submitted February 27, 2006.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov/. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Constantine Hannaher
Primary Examiner